

REMARKS/ARGUMENTS

General Remarks

Applicants thank Examiners Gardner and Barton for the courtesy of an interview extended to Applicants' representative on August 12, 2010. Arguments similar to those presented during the interview are reiterated below. In addition, the amendments to claim 21 as presented and discussed in the interview have been reproduced herein. Lastly, Applicants thank Examiner Gardner for the indication that such amendments to claim 21 "overcome the current prior art of record" (see Interview Summary Report with a mail date of August 20, 2010).

Claim Status / Support for Amendments

Claims 21, 24-26 and 28-42 are pending. Claims 1-20 and 27 were previously canceled without prejudice, and claims 22 and 23 are currently canceled without prejudice. Claims 31-42 are withdrawn pursuant to a previous Restriction Requirement. Claim 21 is currently amended. Claims 24-26 and 28-30 remain as previously presented.

Amended claim 21 finds support in the specification as follows:

(i) "arranging sealing resin sheet pieces having a thickness at least 0.2 mm thicker than that of the sum total value of the thickness of the solar battery cells and the thickness of the conductor at a space between the solar battery cells so as to be sandwiched by the first sealing resin sheet and the second sealing resin sheet" finds support at page 24, line 22 to page 25, line 5;

(ii) "applying a load by atmospheric pressure from both the front and back surfaces by discharging air between the transparent panel of the light reception surface side and the back face panel" finds support at page 22, line 24 to page 23, line 5;

(iii) “melting the first sealing resin sheet, the second sealing resin sheet, and the sealing resin sheet pieces by heating to form a molten sealing resin; and cooling ~~the first sealing resin sheet, the second sealing resin sheet, and the sealing resin sheet pieces~~ the molten sealing resin to obtain plural solar battery cells sealed within the solar battery module; wherein the first sealing resin sheet, the second sealing resin sheet, and the sealing resin sheet pieces ~~independently~~ comprise at least one resin selected from the group consisting of ethylene-vinyl acetate copolymer, polyvinyl butyral, and polyurethane” finds support at page 7, lines 24-25 and page 8, lines 19-23;

(iv) “a single vacuum system in which the outside of a sealing treatment vessel is kept at atmospheric pressure is employed” finds support at page 28, lines 10-13;

(v) “the sealing treatment vessel comprises a bag, the entirety of the bag being made of a gas non-permeable soft film” finds support at page 29, lines 5-7;

(vi) “the single vacuum system comprises plural bags arranged in a heating device” finds support at page 29, lines 20-23; and

(vii) “when the temperature rises, the resin is softened, the thickness of the sheet pieces to which a load has been applied is reduced, and the cells or the portion of the conductor connected to the cells is brought into contact with the upper and lower sealing resin sheets, and the cells or the conductor connected to the cells are brought into intimate contact with the softened sealing resin sheets such that the former is embedded in the latter” finds support at page 23, lines 5-14.

No new matter is believed to have been entered.

§103(a) Rejection

Claims 21-26 and 28-30 are rejected as obvious over the combination of Kataoka (JP 09-036405), Fujisaki (JP 61-166182) and Takabayashi (US 2002/0195136). Applicants respectfully traverse this rejection.

A. Present Invention

The present invention relates to a process of producing a solar battery module comprising plural solar battery cells. The object of the present invention is “provide a process of producing a solar battery module which, when plural solar battery cells are arranged and sealed by a transparent resin, can prevent breakage of the solar battery cells” (specification: page 5, lines 11-15). Applicants submit that such an object has been attained by the present invention as currently claimed.

More specifically, Applicants point out how/why the newly added limitations of independent claim 21 aid in attaining the object of the present invention. With respect to newly added limitation (i) as described-above, Applicants submit that page 24, line 22 to page 25, line 5 of the specification explains how this limitation makes it “possible to prevent a phenomenon that an excessive load is applied to a portion [of the solar battery cells] to which the load is most likely applied.”

In addition, the following excerpt from page 22, line 24 to page 23, line 16 of the specification explains the mechanism of preventing breakage of the solar battery cells, which is related to newly added limitations (ii) and (vii):

“By arranging the sealing resin sheet piece 11 thicker than the thickness of the solar batter cells 4 in the space 9 between the solar battery cells 4, when the internal pressure is reduced, a load by the atmospheric pressure from the front and back surfaces is not applied directly to the solar battery cells 4, and the sealing sheet piece 11 receives that load. And, when the temperature rises, the resin is softened, the thickness of the sealing resin sheet piece 11 to which a load has been applied is reduced, and the cells or the portion of the conductor connected to the cells is brought into contact with the upper and lower sealing

resin sheets. At that time, since the resin sheets are entirely softened, the load is not locally applied, and it is possible to bring the cells or the conductor connected to the cells into intimate contact with the softened sealing resin sheets such that the former is embedded in the latter. In this way, it is possible to prevent cell cracks in the pressure reduction step.”

Figures 2-4 also provide illustrative representations of that described above on page 22, line 24 to page 23, line 16.

With respect to newly added limitations (iv), (v) and (vi), Applicants note that these limitations provide for a sealing treatment vessel that is both simple and flexible, and is capable of producing solar battery modules having various shapes and size and is able to perform laminating operations for plural bags. See page 28, lines 16-21, page 29, lines 3-12, and page 20, line 20 to page 30, line 3. In addition, Applicants note that given the sealing method of the present invention and the sealing treatment vessel described, the present invention is able to prevent cell cracks even in a single vacuum system wherein a load is applied in a vertical direction to the laminate before melting of the sealing resin.

B. Non-Obvious Differences Between the Present Invention and the Cited References

The Office has alleged that it would have been obvious to one skilled in the art to use the spacers of Fujisaki in the device of Kataoka. However, Applicants submit that this is incorrect for at least the following reasons.

The spacers of Fujisaki are made of silicone rubber and silicone rubber is not melted at the heating temperatures employed in this art. In contrast, the sealing resin sheet pieces of the present invention comprise at least one resin selected from the group consisting of ethylene-vinyl acetate copolymer, polyvinyl butyral and polyurethane, all of which are melted at the heating temperatures used.

Accordingly, Applicants submit that the spacers of Fujisaki, even if incorporated into the device of Kataoka, would not provide for “melting the first sealing resin sheet, the second

sealing resin sheet, and the sealing resin sheet pieces by heating to form a molten sealing resin; and cooling the molten sealing resin to obtain plural solar battery cells sealed within the solar battery module; wherein the first sealing resin sheet, the second sealing resin sheet, and the sealing resin sheet pieces comprise at least one resin selected from the group consisting of ethylene-vinyl acetate copolymer, polyvinyl butyral, and polyurethane” as claimed.

In addition, the Office has alleged that it would have been obvious to one skilled in the art to modify the material of the spacers of Fujisaki to be that which is the same material used for the top and bottom resin sealing sheets. Assuming *arguendo* that such a modification were obvious, even though Applicants submit that it is not, Applicants note that none of the cited references disclose or suggest “sealing resin sheet pieces having a thickness at least 0.2 mm thicker than that of the sum total value of the thickness of the solar battery cells and the thickness of the conductor” as claimed.

As explained above, this thickness-related limitation of the present invention makes it “possible to prevent a phenomenon that an excessive load is applied to a portion [of the solar battery cells] to which the load is most likely applied.” Accordingly, the sealing resin sheet pieces of the present invention can receive a load by the atmospheric pressure from both the front and back surfaces while discharging air. In contrast, the silicone rubber of Fujisaki is too soft to receive such a load.

In light of the foregoing, Applicants submit that no combination of the cited references renders obvious the present invention including all of the currently claimed features. Accordingly, and in light of the Examiner’s apparent agreement to this effect (see Interview Summary), Applicants respectfully request withdrawal of the obviousness rejection of record.

Conclusion

For the reasons discussed above, Applicants submit that all now-pending claims are in condition for allowance. Applicants respectfully request the withdrawal of the rejections, withdrawal of the restriction requirement, and passage of this case to issue.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.
Norman F. Oblon



Justine M. Wilbur

Attorney of Record

Registration No. 59,678

Customer Number

22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 08/07)